The Veterinary Record.

(Founded by William Hunting, F.R.C.V.S., 1888.)

No. 50. DECEMBER 11, 1926. Vol. 6.

Mastitis.

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I have read with great interest, in the *Veterinary Record* of November 20th, in the proceedings of the Mid-West and South Wales Division, a discussion opened upon "A Virulent Type of Mastitis."

Mr. Hall there admirably describes a type of case which every practitioner in dairying districts dreads to meet, for he knows how unsatisfactory any treatment which he may adopt must be. The type of mastitis under discussion is quite a distinctive one, and frequently, on superficial examination, the condition in the udder hardly seems sufficient to account for the fact that the animal is extremely ill. There is frequently little pain evinced on handling of the affected part; it is swollen, and is somewhat "doughy" to the touch, pitting on pressure. The contents of the sinus are flaccid and soft, and when withdrawn, are most offensive.

The condition has frequently been described as "July" or "August" udder, as it is most commonly found during these months, especially if the weather be hot, with frequent rainy intervals, and the general conditions are most favourable for fly breeding. The disease frequently attains the magnitude of an epidemic, affecting not only actively-lactating animals, but dry cows, and in practically all cases the toxæmia is profound and the prognosis, especially if more than one quarter be affected, grave.

Removal of the teat, with subsequent free drainage, is no doubt the best method of treatment, except in those cases where the teat is large, and the lumen roomy enough to allow frequent emptying without difficulty. The affected animal should, wherever possible, be isolated, and the material drawn from the infected parts should not be drawn on to the floor, but into some suitable vessel and subsequently properly disposed of. I have little doubt that such infected animals are a serious source of danger, and infection in concentrated form can be carried direct from them to others by the same medium as was probably the carrier in the first instance.

I am, however, more concerned with the prevention of this condition than with treatment, and after close observation for many years, I am of opinion that the principal factor in its causation is the common fly.

Most of us have seen how swarms of flies congregate, after milking, around the orifice of the teat, for that drop of milk remaining in the saucer-like little depression at the end of the teat, and there is little difficulty in understanding how such infection may be developed, *via* the duct upwards.

Having this in view, I have, for many years past, advised the anointing the end of each teat with some adhesive disinfectant, such as carbolised vaseline, or carbolised zinc ointment, 1—15. Each milker is supplied with a small tin of the ointment which he carries in his pocket and, on the completion of milking, dabs a small portion on to the end of the teat.

The result of this practice has been most gratifying and has led, where properly carried out, to a complete prevention of the condition.

In the case of dry cows lying out, I have found it to be quite sufficient to bring them up once a week to have their teats dressed in the same manner.

It is not often in these days that I trouble you with my views, but intimately concerned as I am with dairy farming, and the supervision of dairy herds, I am impressed more and more each day with the enormous losses dairy farmers suffer from such conditions, which do not appear to be fashionable enough for voluntary research, but enquiry into which might well be subsidised, if not by Government, by the dairy industry itself.

"A Policy of Science."

In the course of a leading article under the above heading, *The Times* of November 3rd, says :—

"The constitution and discussions of the Research Special Sub-Committee of the Imperial Conference are satisfactory signs that the British Empire as a whole is becoming aware of its need of scientific knowledge. They coincide with, and are doubtless inspired by, the adoption of a new attitude in this country towards research work in the Crown Colonies. The recent visits of Mr. Ormsby-Gore to East and West Africa are incidents in a definite "policy of science" which must very soon bring about changes of a far-reaching kind alike in health administration, in stock-rearing, and in agriculture. Within the last few months a Chief Medical Officer has been appointed to the Colonial Office, and steps are being taken to secure trustworthy advice on questions of veterinary medicine in the tropics, on entomological and mycological problems, and on the application of scientific principles to every branch of agriculture. The importance of these steps can scarcely be exaggerated. There are vast areas in Africa in which, solely because of disease, no cattle are kept, and which consequently lack dairy produce of all sorts; there are other equally vast areas in which the herds and flocks remain continually at the mercy of epidemics . . . .

"If its enterprise is to succeed, the Colonial Office must recruit men of science possessed of special training, and here there is a difficulty which it will not be easy to overcome. Tropical medicine and hygiene have emerged from their primitive period of development; but the same cannot be said of veterinary medicine in the tropics. Thus it is necessary in the immediate future to establish means of educating young men in what is largely a new branch of study. Various plans to this end have been under consideration recently, and a proposal has been sanctioned to hold in the Dominions a series of conferences on veterinary medicine. The first of these conferences, it is understood, will take place in South Africa, where the special training of veterinary officers is carried out on lines that may well serve as the model for the whole Empire. . . . . It is evident that sooner or later the Colonial Office may be compelled, in furtherance of its admirable policy, to lay down in broad outline a scheme of training for those whom it proposes to employ on its scientific staffs."

Anthrax.*

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Anthrax is one of the oldest known and most widely distributed diseases of animals, and it assumes its importance, not only on account of the mortality it produces in these animals, but also on account of its communicability to man.

While anthrax is responsible for a considerable mortality amongst stock in this Colony, the disease in this respect by no means compares with diseases like East Coast fever and rinderpest. The incidence of the infection amongst the native population, however, would appear to be unusually severe at times, when one considers the comparative rarity with which the human being is infected in European countries.

For the reason of the existence of anthrax, and its apparently recently-increased prevalence, in this Colony, the Veterinary Medical Association has asked for the contribution of this paper, which is written not only for the veterinarian, but also for the stock-owner. It has been considered advisable to give a general outline of the disease as it is recognised in this and other countries, with special reference to certain points of variation which are observed in Kenya. These refer more particularly to spread of infection and control of the disease. Reference to the available literature on the subject of anthrax has been made in writing this paper.

Anthrax may be described as a specific febrile infection caused by the entrance into the body of the causal organism—the *Bacillus anthracis*.

The disease attacks all animals, including man. The animals susceptible, under natural conditions, include cattle, horses, mules, donkeys, sheep, goats, pigs, camels, elephants, dogs, and cats. The wild ruminants are also susceptible to infection, and the following animals in captivity have been shown to be susceptible by eating infected flesh: lions, leopards, ant-eaters, badgers, and bears.

Birds are also susceptible, and natural outbreaks of anthrax have been observed amongst ostriches in South Africa.

With regard to the degree of susceptibility, there is considerable variation, but it may be taken as a general rule that cattle and sheep are most susceptible; next in order come horses and pigs.

In man it would appear that the disease does not occur as a natural infection, except in cases resulting from the ingestion of infected flesh. It is communicated to man directly or indirectly from animals, either by eating anthrax-infected flesh, by accidental infection of wounds, or by the inhalation of the organism in the dust arising from infected material, *e.g*, in the case of men engaged in the handling of skins of sheep dead of anthrax, or skins contaminated with infected blood.

Direct infection of natives in this Colony occurs as a result of the ingestion of meat from cattle dead of anthrax. In a great proportion of these cases apparently no ill-effects are observed; in some cases mild or severe symptoms with recovery occur, while in others death results.

Outbreaks of anthrax in stock in this Colony are reported most frequently in cattle, more rarely in pigs, horses and mules, and very rarely in sheep and goats. The incidence of the disease in sheep may prove, on investigation, to be greater than we suppose. These animals do not usually get individual supervision as in the case of bovines, and, therefore, cases of anthrax in sheep may occur and not be diagnosed as such, or, indeed, no attempt may be made to establish the cause of death.

Dogs (especially old ones), cats, and carnivorous mammals show considerable resistance to the disease. So also do birds, and, with the exception of the ostrich, it is extremely rarely that natural outbreaks do occur in birds.

With regard to breeds of the various animals, the only reported case of some variation in susceptibility is that of Algerian sheep, which are said to be highly resistant to infection.

Young animals are considered to be more susceptible than old ones, but outbreaks may occur in which only adults are affected, although both adult and young may be exposed to infection.

In animals of the same species and breed, there is considerable variation in susceptibility, as is shown by cases which occur in natural infection, and in reactions following preventive inoculation by vaccines. There is no doubt that the physical condition of the animal affects resistance to infection, although this must not be taken as the necessary factor allowing infection.

Fatigue, starvation, and sudden lowering of temperature increase susceptibility. Such factors are held to explain cases of anthrax in stock after a long drive, or prolonged railroad transport, or in heavy working draught or transport oxen, and those cases occurring in cattle and sheep very soon after dipping.

It has been shown in experimental laboratory animals that the causal organism can be harboured in the internal organs, without any apparent ill-effects. By decreasing the vitality of such animals by sudden lowering of temperature, by injury, starvation, administration of toxic drugs, or infection with some other disease, acute anthax may be produced.

Symptoms and Course of the Disease.

It is not possible to state a definite incubation period of the disease, since various factors appear to be in involved, allowing actual entrance of the causal organism into the body tissues after they have been taken up by the susceptible animal. After subcutaneous or intravenous inoculation, the manifestations of the disease usually appear within 24 to 48 hours.

In all species of animals, more so in some species than others, occasionally no symptoms of illness are seen, the affected animal suddenly dropping dead. The symptoms, generally, are those of an acute febrile disease, and are often not sufficiently characteristic to warrant a diagnosis of anthrax.

* Paper presented on the occasion of the Second Ordinary General Meeting of the Veterinary Medical Association of Kenya Colony and Protectorate, held at the Veterinary Laboratory, Kabete, on July 30th and 31st, 1926.

Symptoms in Bovines.—Three forms of the disease may be described.

(1) *Per-acute form.*—Death occurs suddenly without any premonitory symptoms, or at most, sudden collapse with convulsions, with perhaps blood-stained discharges issuing from the natural openings, and dark, bluish-red discoloration of the visible mucous membranes.

(2) *Acute form.*—This form represents the majority of cases in bovines. The symptoms include elevated temperature, increased respirations and pulse, depression, and cessation of rumination. The visible mucous membranes show a dark-bluish-red colour, and there is some tympany and constipation, followed by watery, blood-stained diarrhœa. Considerable quantities of blood may be passed in the fæces, and the urine is dark red in colour, and may be blood stained. With these symptoms the affected animal shows signs of distress, with abdominal pain. The milk secretion ceases shortly after the onset of the disease. Pregnant animals may abort. Occasionally, diffuse subcutaneous swellings on any part of the body may be seen.

(3) *Sub-acute form.*—The symptoms observed in acute cases, but with lessened intensity, may be seen in these cases, and recoveries may occur. The subcutaneous œdematous swellings, already mentioned, may be present, especially on the neck, breast, abdomen, and flanks. These swellings may be hot to the touch and pit on pressure, and the overlying skin shows no change. Outbreaks of anthrax have been observed in this Colony in which these swellings were the predominant symptoms. Moreover, such cases are often confused with those of snake bite, and, in such cases diagnosis is often difficult.

In temperate and cold climates, the practice is sometimes adopted, during an outbreak, of taking the temperatures of all animals in contact, and of considering those animals showing marked elevation of temperature as being infected. In this Colony the temperatures of domesticated animals vary so much with conditions of housing, time of day at which temperatures are taken, exposure of animals to the sun, external temperature, weather, and the possible existence of other febrile affections, that this method of diagnosis of anthrax in in-contacts, is of no great value.

Symptoms in Equines.—The acute symptoms as described for bovines are sometimes observed. In these animals, however, symptoms of severe colic are frequently seen, or the chief symptoms may be an acute swelling of the region of the throat, which swelling gradually increases in size, and extends down the neck to the chest. In these cases, also, symptoms of pharyngitis are seen, and a thin hæmorrhagic discharge issues from the nose, and there is a marked salivation.

The horse is ultimately unable to swallow, and death often results within 36 hours. Occasionally a case may linger on for a few days.

Symptoms in Sheep.—The course of the disease is usually very rapid, no symptoms being observed, and the affected animal is found dead. The symptoms as described for acute cases in bovines may also be seen in sheep.

Symptoms in Pigs.—In these animals symptoms of acute pharyngitis, with marked swelling of the region of the throat, are seen. This swelling may cause considerable difficulty in deglutition and respiration. In some instances no symptoms beyond depression and suppressed appetite are observed.

In Dogs, and other carnivorous animals, symptoms of pharyngitis and acute gastro-enteritis are seen.

In Ostriches, the acute form of the disease is usually seen, although mild cases, with symptoms of depression, and suppressed appetite, and eventual recovery may occur.

Post-Mortem Lesions.

For reasons which will be given later, it is not desirable to hold *post-mortem* examinations on animals in which the cause of death is suspected to be anthrax. Anthrax carcases, however, are frequently opened and examined, when some other affection is suspected. The following is a brief summary of the lesions usually found on *post-mortem*.

The carcase is very frequently markedly distended and decomposes rapidly. Blood-stained discharges issue from the natural body openings, and the visible mucous membranes are dark bluish-red in colour, and show small hæmorrhages beneath the surface.

On incising the skin, the subcutaneous tissues are seen to be infiltrated with a yellowish gelatinous exudate, and this exudate may extend into the intermuscular tissues.

The subcutaneous vessels are engorged with blood which is of a dark red, almost black colour, like tar, and which does not clot readily, if at all. The inner surface of the skin, and the subcutaneous tissues generally, show well-marked blood extravasations up to the size of a shilling of even larger. The muscular tissues show similar blood extravasations.

The abdominal and thoracic cavities contain large amounts of blood-stained exudate; the yellowish gelatinous exudate already described is also seen in the sub-serous, and sub-mucous connective tissues, in the mesentery, and the tissues surrounding the kidneys; also under the mucous membranes of the pharynx and larynx, and in the tissue surrounding the tongue.

The lymphatic glands, generally, are markedly swollen, hæmorrhagic and œdematous.

The spleen is usually very much enlarged, the pulp being blackish-red in colour, soft in consistence, sometimes almost fluid. The distension of the spleen capsule by its contents may be so great as to increase the size of the organ to several times the normal, and the capsule may even burst. The capsule may appear to be raised in tumour-like swellings. In rare instances the spleen may show only a few blackish-red, softened areas of various sizes, and fresh hæmorrhages.

The liver and kidneys show acute congestion, as also do the lungs, which are often filled with œdematous fluid. The mucous membranes of the pharynx and larynx are markedly congested, while that of the small intestine, more rarely of the stomach and large

intestine, is swollen in considerable portions, intensely red, and permeated with small, blackish-red, hæmorrhages, and often small and large necrotic areas.

The trachea and bronchi contain frothy, blood-stained discharge. On the inside and outside linings of the heart small hæmorrhages are seen.

The above changes are seen more particularly in acute cases in bovines. The more slowly the disease has progressed, the more marked are the pathological changes seen, especially the inflammation and ulceration of the intestinal canal.

Where subcutaneous swellings have been observed during life, section of these shows the yellowish, gelatinous fluid infiltration of the tissues with a certain amount of hæmorrhage.

When throat lesions are seen, as occurs chiefly in pigs, but occasionally also in horses and dogs, the swollen tissues show this marked gelatinous hæmorrhagic infiltration, with enlargement, congestion and œdema of the associated lymphatic glands.

In pigs, the tonsils are covered with a pale, yellowish membrane, surrounded by the greatly swollen mucous membranes. Dark raised necrotic areas on the mucous membrane of the pharynx are common lesions seen in pigs dead of anthrax.

The lesions described for bovines are also seen in horses, sheep, and pigs, but splenic enlargement is not so characteristic of these latter animals.

The spleen in pigs may show merely circumscribed brownish or grayish-red nodules in the pulp, which may not be very swollen.

In the case of sheep, beyond acute congestion of the parenchymatous organs, *e.g.*, liver, lungs, spleen, and kidneys, no other changes may be observed by the naked eye.

In ostriches the lesions correspond with those seen in acute cases in bovines. The spleen, however, may show no change, or only slight swelling.

The Causal Organism and the Spread of the Disease.

The *Bacillus anthracis* is a small bacterium with definite morphology, staining reactions, and cultural characteristics, by means of which it is differentiated, for the purpose of diagnosis, from other pathogenic and non-pathogenic organisms. It is easily cultivated, and many important points with regard to spread and control of the disease have been worked out by laboratory methods.

The bacillus multiplies by fission and spore formation, the latter being the highly-resistant stage in the life of the organism, and the chief means by which the disease is perpetuated and spread.

The bacilli appear in the blood of animals suffering from anthrax, at most a few hours or immediately before death. At death, the bacilli are usually present in enormous numbers in the blood and body tissues. Further, the discharges and fæces, and the urine, contain the causal organism when these discharges show the changes resulting from infection. The milk contains the organism only a few hours before, or immediately at, death, but since this secretion is entirely suppressed comparatively early in the course of the disease, there is a very little chance of milk being responsible for transmitting infection. The bacilli are ærobic; that is, they require oxygen for their multiplication, and free exposure to the oxygen of the air is indispensable for their development. Growth, however, can take place to a limited extent in the absence of oxygen.

Immediately before, and at, death, the bacilli rapidly use all the oxygen in the blood of the animal, the anærobic organisms from the intestine soon multiply and cause rapid decomposition of the carcase and degeneration of the bacilli.

The temperature limits for the growth of the organism and the formation of spores are 12 deg. C. to 45 deg. C., the *optimum* temperature for growth being 35 deg. C. to 37 deg. C. (*i.e.*, body temperature). The temperature most favourable to spore formation is 32 deg. C. to 35 deg. C., but it may take place at lower or higher temperatures—from 14 deg. C. to 42 deg. C. Sporulation, therefore, can occur at the ordinary temperature of summer heat or even lower, and at summer temperature sporulation may occur in three to four hours.

In the animal body, anthrax bacilli multiply exclusively by direct division, spores never being formed in the blood and tissue fluids of the animal, or in the unopened carcase, since a liberal supply of oxygen is necessary for the purpose.

There is an enormous difference between bacilli and spores in their resistance to chemical and physical agents.

The bacilli are said to be destroyed by drying in layers in the sunlight in from six hours to 20 days, according to the thickness of the layer. In dried blood they may remain virile for a month or longer, and may then form spores on the addition of water, and in suitable temperature conditions. The bacilli die in putrid blood, especially in a putrid, unopened carcase in warm weather, in from two to three days. They are more resistant to low temperatures than to higher ones, and are rapidly destroyed in urine collected from stables and bomas, and also by disinfectants. *The spores*, on the other hand, are highly resistant to most agents. Simple drying does not destroy them after long periods, and in this condition they may remain alive for years. They show similar resistance in pure or putrid water, decomposing blood, in soil and urine, provided the temperature be kept at or near body temperature. Similar resistance again is shown by spores in hides taken from animals dead of anthrax. Dry or moist heat, somewhat above boiling point, rapidly kills them, as also do strong disinfectants. Disinfectants rendered even faintly acid are considerably more toxic to the spores than are alkaline solutions. There is a great variation in the resistance to any agent of individual spores, some spores being apparently extraordinarily resistant. The longevity of spores in the soil is sufficiently great to explain how anthrax may be spread by means of infected feeding materials, soil, and water.

From the foregoing it can readily be seen that, to prevent spread of infection the one important factor is to prevent the formation of spores in the carcase of an animal dead of anthrax. The condition essen-

tial to the formation of spores is the early access of free oxygen to the bacilli contained in the carcase. It is therefore obvious that the carcase of an animal dead of anthrax should not be opened, but be immediately burned or buried deeply. Once spores are formed, and spread over the ground or pasture, they can remain virulent for years, and under suitable conditions they develop into bacilli, which again multiply by fission and again form innumerable spores.

This multiplication and development is possible under three main conditions — suitable temperature, moisture, and media for growth. In those parts of the soil rich in organic matter, *e.g.*, sweepings from bomas, this multiplication readily takes place, and it is said to occur in less favourable surroundings provided temperature and moisture be sufficient. In this Colony the conditions would appear to be more favourable than in other more temperate climates.

Anthrax usually occurs sporadically, but occasionally as an enzootic, these enzootics being limited to certain areas with no tendency to spread. In European countries it may be said that the disease is more frequent in the summer months, but in this Colony it would appear that cases are reported during all months of the year from various parts of the country. Even in an individual district or an individual estate, the occurrence of anthrax has not always been confined to a particular season. There does seem to be some increase in the incidence of the disease, however, towards the end of the rainy season, and immediately after the rains have ceased. The disease is generally said to be more prevalent on marshy or swampy land, especially when the land is periodically flooded. On the other hand, cases of anthrax may occur when the weather is very dry and the grazing close and poor. In these instances infection has been attributed to close grazing, and ingestion of spores of anthrax with the soil.

As might be expected, cases of anthrax sometimes occur amongst stock grazing on land manured with infected material, *e.g.*, blood or bone manure. In European countries it is generally recognised that animal products, *e.g.*, skins, hides, blood and bone manure, bone meal, etc., play a more important part in spreading the infection than do vegetable products, although cases have been proved to originate from the ingestion of infected grain and straw. Usually, however, cases resulting from the ingestion of infected vegetable products arise from such products having been in contact with animal products or soil.

In Germany during the war the incidence of anthrax considerably diminished as compared with the incidence of the disease pre-war and post-war. The explanation given for this diminution during the war, is the cessation which resulted, owing to war conditions, of the importation of animal and vegetable products capable of carrying the virus of the disease.

In this Colony, outbreaks of anthrax have been observed under varying conditions, and the disease would appear to be widespread. This is not surprising in view of the total lack of proper disposal of infected carcases by the stock-owning natives, who, apparently frequently have cases of the disease in their herds. The natives frequently eat carcases of animals dead of the disease, and, even when the carcase is not eaten, it is frequently skinned for the sake of the hide. The natives must spread infection enormously.

Cases of the disease have been reported amongst stock which have been permitted to graze over pasture which was at one time the site of a native cattle boma. The conditions for the survival and even multiplication of the virus of the disease in a disused native cattle boma and its surroundings, are ideal, and in the practice of grazing cattle over such areas lies a real danger. From the carcase, infection can be spread by the agency of dogs, pigs, and very probably it is also spread by wild carnivores and carrion. The part that the sick animal may play in spreading infection through the medium of its infected discharges must not be overlooked.

In addition, infection may be spread from a sick animal by the opening up, by surgical means, of anthrax swellings appearing on the body. This may be done as a therapeutic measure, or for the purpose of establishing a diagnosis. When this is done the incision should be immediately seared with a hot iron. Cases are also observed in this Colony amongst stock on good pasture, or in very short dry grazing, and it is assumed, in these cases, that in the former the pasture is infected, and in the latter the spores of anthrax enter the body with ingested soil due to close grazing.

In improperly-buried infected carcases, in which spores have formed, it has been proved that earth worms are capable of bringing spores to the surface; also that maggots can ingest spores which remain viable in the maggot's intestinal tract. It has been proved, also, that a water supply can be infected with the spores of anthrax, and so be responsible for an outbreak, the spores having been washed by heavy rains from infected to more distant places, *e.g*, dams, swamps, rivers, and irrigation streams, etc., led from these. Cattle may die at such places, and so further spread infection.

With regard to the method of infection of animals, it is assumed that ingestion is the chief mode of infection. It has been proved that the bacilli themselves are rapidly destroyed by the gastric and intestinal juices, but that the spores are highly resistant to these agents. The oral administration of spores does not always produce infection, and it is probable that infection takes place through some injury to the intestinal mucosa.

Pigs almost invariably contract the disease by the ingestion of flesh and other material infected with the causal organism.

The possibility of infection by inhalation must not be overlooked, since it has been shown that small experimental laboratory animals can be infected in this way, indeed more readily than by ingestion. Moreover, inhalation infection does occur in man. Infection by wounds in animals is possible, but must be considered rare.

With regard to biting flies spreading infection, stable-flies (Stomoxys) and other biting flies have been proved capable of transmitting infection to experimental animals provided, (1) They bite an infected

animal when anthrax bacilli can be demonstrated in the blood of that animal, *i.e.*, very shortly before or at death, or immediately after death. (2) They bite a susceptible animal immediately after biting the infected animal.

The possibility, therefore, of these biting flies spreading infection in a recently-infected herd must be considered.

Diagnosis of Anthrax.

(1) *Infected animals during life.* — This is very seldom possible with any degree of certainty. The most suspicious symptoms may be:—The œdematous swellings on any part of the body in bovines and equines, although, in this Colony, too much reliance cannot be placed on these, since they occur also in snake bite, and in trypanosomiasis, the latter especially in equines. They have been observed, also, in other obscure affections which were proved not to be anthrax. The swelling of the region of the throat in equines and pigs. In the case of pigs, it is a very suspicious symptom.

The other symptoms already described do not often lead one to suspect anthrax infection, since they are also more or less typical of other acute febrile abdominal affections. Sudden deaths in animals in this country do occur from conditions the etiology of which is as yet unknown.

The bacteriological examination of fluid from incised swellings, of discharges, and of blood, during life is seldom resorted to.

Diagnosis after Death.

(1) *Post-mortem examinations* are usually held where anthrax infection is not suspected, and, indeed, they should not be held where there is any doubt. The chief lesions seen have already been described.

(2) *Bacteriological examination.*—Blood smears are usually prepared for examination. Smears from a peripheral blood-vessel, *e.g.*, a vessel of the ear, are most suitable, since the peripheral circulation is the last to be invaded by *post-mortem* organisms from the intestine. Blood smears are usually satisfactory in the ox, and in most cases in the sheep. In the former, however, sub-acute, but fatal, forms of the disease, with local swellings as the chief *ante-mortem* symptom and *post-mortem* lesion, have been observed in ' this Colony. Blood smears have proved negative, as also have some of the smears made from the swellings. In these cases cultural examination, or animal inoculation with material from the swellings, has been carried out with positive results.

In horses and pigs, blood smears are sometimes negative, and in these cases smears from the local swellings, or the associated lymphatic glands, are usually positive. If not, cultural examination or animal inoculation has again to be carried out.

(3) Cultural Examination and Experimental Animal Inoculation.

For this purpose, swabs, or small pieces of suspected material are sent, carefully packed, and from these, if desired, either of the above tests can be carried out. Except in doubtful cases, specimens other than smears should not be sent.

(4) *The precipitin reaction* is sometimes used for diagnostic purposes, especially in the case of decomposed material which may or may not have been buried. The principle of the reaction lies in the fact that serum from an animal specially immunised against anthrax produces, in contact with a specially-prepared extract of anthrax material, a precipitate. For suspected material, spleen or blood is best, but other organs, especially those showing marked pathological changes, are also suitable. The material for examination is forwarded without the addition of any preservative, or other treatment.

Treatment of Anthrax.

The treatment of cases of anthrax in the domesticated animals is not generally practised, and in the generalised form of the disease, is not considered hopeful. Where treatment is adopted, it is difficult in most instances to say whether recovery is spontaneous, or due to therapeutic measures.

The medicinal agents which have been tried, and in some instances recommended, usually consist in the oral administration of internal antiseptics, *e.g.*, creolin, lysol, carbolic acid, etc., or the intravenous injection of aqueous solutions of collargol, etc. The intravenous injection of a dose of effective anti-anthrax serum is of value. A dose of 100 c.cs. is usually given in the case of bovines.

The surgical treatment of cases in which local swellings are seen would appear to be of little value. It consists in free incision into the swollen part. The danger of spread of the infection in this way is considerable.

Some experiments have recently been carried out in America on the therapeutic value of methyl violet and acriflavine solutions, and favourable results are indicated by the authors. The experiments have been carried out in sheep, in a state of advanced generalised anthrax infection.

The dose given in the case of each drug was 7 milligrams per kilo (2.2 lbs.) body weight. The methyl violet was prepared as a 1 per cent. solution in water, while the acriflavine was prepared as a solution of the same strength in normal saline. Further experiments on the value of these drugs in the treatment of anthrax are being continued in America.

The Control of Anthrax.

The methods by which this is effected may be directed towards elimination of source and spread of infection, with or without preventive inoculation.

The methods employed in the various countries are not identical, chiefly because the use of preventive inoculation has not always been favourably considered, in some instances the inoculation being thought not to be without risk, and in others the cost of inoculations outweighing the cost of other methods employed in dealing with the disease. In some cases, too, the disease is kept in control without preventive inoculation. This is possible only in countries where the incidence of the disease is not great for climatic and other reasons, and where the regulations dealing

with the disposal of infected carcases and material can be rigidly imposed.

The method of short quarantines may be adopted, the apparently healthy animals in an infected herd being removed to a clean area, and the quarantine being removed in one week if no further deaths occur.

It is obvious that the removal of susceptible animals from the suspected or known infected area to an area considered to be free from infection, is necessary. The suspicious areas may be muddy drinking water, dams, native bomas, low-lying swamps, etc., or places where animals are known to have died from some suspicious disease, and animals should not have access to these. Suspected areas may be fenced off.

The elimination of the spread of infection is the all-important factor in the control of the disease, by the proper disposal of infected carcases and material.

The carcases of animals dead of anthrax should not be opened, but should be buried on the spot. If burning be impossible, burying, at least four feet below the surface of the ground, should be carried out. The idea of deep burying is that the temperature of the ground at a depth is below that at which spore formation of the organism takes place. It is doubtful whether four feet is sufficient in this country. In addition, all excreta, discharges from infected animals, and litter contaminated by these should be burned or buried, and the place where the animal has lain should be thoroughly disinfected.

In this Colony the chief difficulty lies in the supervision of disposal of native-owned stock dead of anthrax.

Preventive Inoculation and Immunity.

An animal which has recovered from a natural infection of anthrax is highly resistant to subsequent infection, either naturally or artificially. It is possible safely to attempt protection of animals against infection, only by the use of attenuated strains of the organism, or the use of serum from hyper-immune animals.

The *Bacillus anthracis* grows at body temperature (37.5 deg. C.), but if the organism be grown for definite, prolonged periods at a higher temperature (42.5 deg. C.), its virulence is permanently decreased, this decrease in virulence being in direct proportion to the length of time the culture is grown at this higher temperature. Moreover, this attenuation remains constant on sub-culture at 37.5 deg. C. Such attenuated cultures are used as vaccines, and several types have been prepared in this way.

The following methods of immunisation have been employed:—

Immunisation with Pasteur's first and second vaccines.—These are the vaccines used in this Colony at the present time. The first is the weaker vaccine, and the second—the stronger vaccine—is inoculated 10 days after the first. The dose of each vaccine for cattle is ½ c.c. and ¼ c.c. for equines, sheep, pigs, and goats.

Immunisation with single vaccines.—Separate single vaccines have been prepared for horses and cattle, their virulence varying, but usually between that of Pasteur's first and second vaccines. They are not generally used, since, if too weak, they do not produce sufficient immunity, or, if too strong, they may be found to be too potent as a single injection. They have a minor advantage in that animals to be inoculated are handled only once. Single vaccines are used in conjunction with hyperimmune serum in the simultaneous method to be described later.

Pasteur's vaccines and the single vaccines are prepared by growing the attenuated organism in specially prepared broth for periods varying in different laboratories, from 2 to 9 days, or until a good growth results.

In the Veterinary Research Laboratory, Kabete, the vaccines are grown for 7 to 9 days in large flasks, subsequently run off into sterile 20 c.c. bottles with special aseptic precautions. All vaccines are tested by cultural and smear examination for their purity, and in small and large laboratory animals for their potency and safety.

Immunity from the use of the double vaccine is considered to be established in about 14 days after inoculation of the second vaccine, and lasts about one year.

Immunisation with spore vaccine.—The organism is attenuated as described above, and the vaccine is prepared by growing the attenuated culture on solid media until spore formation is advanced. This heavy sporulated growth is washed off and suspended in a glycerin-saline solution, and this suspension constitutes the vaccine. The advantage of spore vaccines is that the spores remain alive for a longer period than the broth-cultivated Pasteur vaccines, and therefore their keeping properties and potency are prolonged. Moreover, the production of spore vaccines is more economical than that of the Pasteur vaccines. They can also be standardised. Spore vaccines are extensively used in Australia and South Africa.

As soon as facilities for the production of spore vaccine are available at the Veterinary Research Laboratory, Kabete, it is hoped that this method will be substituted for the present double vaccine method.

Immunisation with immune serum.—If animals susceptible to anthrax are injected with increasing doses, first of attenuated, and later of fully virulent anthrax cultures, a serum can be obtained from such animals, and which has protective properties against natural infection.

The action of this serum, when injected, becomes effective within a few hours, and it establishes a passive immunity which is of short duration, lasting only one to two weeks. Immune serum is used either:—

(1) To prevent spread of infection in an outbreak when immunisation by vaccine is not desired.
(2) As a curative in large doses in animals already infected.
(3) To be used in conjunction with an attenuated vaccine (simultaneous method).

As a curative for cattle, serum is injected intravenously in doses of 50-100 c.cs. As a preventive, it is similarly injected into cattle in doses of 20 c.cs., and in sheep in 10 c.c. doses.

Immunisation with vaccine and hyperimmune serum.—This consists of simultaneous inoculation with a dose of hyperimmune serum (10-20 c.c.), and an attenuated vaccine—usually Pasteur's second vaccine. This method has been extensively used in European countries, in America, Argentina, Uruguay, etc., with, in general, good results. It is considered to have the advantage of being able to use a more potent attenuated vaccine at once, and so develops a good immunity in a short time. It has an additional advantage, in that animals are handled for inoculation once only, except where a second inoculation to reinforce immunity in severe outbreaks is required.

With regard to the use of Pasteur's first and second vaccines in this Colony, the results obtained in the practice would appear to be very satisfactory.

Unfavourable results have, at times, been encountered in all countries by the use of anthrax vaccines, but, taken as a percentage, these failures are not great.

Unfavourable sequelæ to vaccination may be:

(1) Accidents following vaccination.

(2) Failure to produce the desired immunity.

With regard to the former, it may be said that inoculation of the vaccine may give rise to a slight rise in temperature in the animal, this elevation being only transitory. At the same time, there is usually a local reaction at the site of inoculation. This consists of a small swelling which may be nothing more than a thickening of the skin, or some infiltration into the subcutaneous tissues. It usually shows slight heat and varying degrees of pain on pressure. No systemic disturbances are generally noted. Such reactions are considered satisfactory. Occasionally, however, there develop, at or near the site of inoculation, on the fore-limb on the site of inoculation or on any part of the body, more or less extensive swellings. Usually these swellings occur without any other disturbances or inconvenience to the inoculated animal. Occasionally, however, elevated temperature, lameness, or systemic disturbances are observed.

In this Colony similar vaccination sequelæ have been seen, but, so far, no mortality has been recorded in which death has been attributed to the inoculation.

Several theories have been put forward as explanations of these severe reactions. Such are:—

(1) Inoculation of organisms other than the attenuated anthrax virus at the time of inoculation, as the result of careless technique. It is known that the injection of certain accidental organisms together with anthrax organisms will sometimes produce severe reactions. Such instances of faulty technique being responsible for the severe reactions, must, however, be considered rare.

(2) Weakened constitution from various causes in the inoculated animals. This may account for some cases, but severe reactions are frequently seen in very robust animals.

(3) The inoculation of increased doses of vaccine. Although bovines, generally, will stand large doses of vaccine, in some instances increased dosage will produce severe reactions.

(4) The individual susceptibility of the inoculated animal. It is observed, during inoculations, that the reactions, however favourable, do vary in degree, and this is attributed to natural susceptibility of the individual animal. This factor possibly accounts for the majority of severe reactions.

Equines, generally, are more susceptible to vaccination than bovines, and care should be exercised, especially in regard to dosage, in the inoculation of these animals.

It is considered that the degree of immunity following vaccination is in direct proportion to the reaction produced.

These occasional severe reactions indicate the potency of the vaccine, and should not be considered unfavourably while no mortality results.

No therapeutic measures, beyond rest and attention to the principles of good animal husbandry, are indicated in the treatment of these local swellings.

With regard to failure to produce the desired immunity, mortality occasionally occurs in vaccinated animals after the period when immunity from vaccination is considered to be established.

In these cases the animals may be exposed to an abnormally heavy infection, or an extremely virulent virus. (It has been proved that there are variations in the virulence of anthrax viruses). Or, again, the mortality may occur in animals which have escaped vaccination, or have failed to react to the inoculation. Or it may be due to the use of old vaccine which is not sufficiently potent. For this reason care is taken, at the Kabete Laboratory, to prepare fresh lots of vaccine at frequent intervals.

When mortality occurs amongst vaccinated animals, it is advisable to re-inoculate them with the second of the double vaccine in the usual dose, or in double doses at fortnightly intervals until mortality ceases.

The recent researches by Besredka in France are held by the author to prove that, in guinea pigs, the skin is the receptive organ or tissue for the virus of anthrax, and it is only by way of the skin that these animals can with certainty be infected. It is held, also, that it is only by actual skin-inoculation (cuti-vaccination) that these animals can be immunised against the disease by means of vaccines, and the author considers that this may also hold good in the case of the larger domesticated animals.

Research in this direction is being continued in several countries, and, indeed, immunisation of some of the larger domesticated animals by cuti-vaccination is being attempted in places, and good results have been reported. These researches will be watched with interest.

For the control of anthrax apart from regulations dealing with the disease, and the use of vaccines, the stock-owners throughout the country, on whose farms anthrax occurs, must assist by the proper disposal of animals dead of the disease. If this could also be realised by the native, it is believed that the present incidence of anthrax in this Colony could be enormously reduced.

(*To be continued.*)

The Veterinary Record.

11th December, 1926.

"VIS UNITA FORTIOR."

In the past there have been many of our professional brethren who have been inclined to scoff at our collegiate motto, and at all efforts made by the few enthusiasts to show a real united front.

Since the war period, however, a great change has occurred amongst us and our National Veterinary Medical Association has made great headway. Its influence has permeated the profession and its power is now appreciated by all with whom we, as a profession, have to deal.

The character and well-being of any family is reflected in the conduct of its offspring: bearing this in mind, it is with particular pride that we publish this week the first instalment of a paper sent to us by one of our most enthusiastic colonial affiliated Divisions, namely, the Kenya Veterinary Medical Association. The paper and discussion would do credit to any scientific body and contain the report of much original work. Dr. Whitworth (who is a veterinary surgeon) and his Society are to be congratulated, and we hope that this paper will be the forerunner of many that we shall have the pleasure of publishing.

The Kenya V.M.A., although young, was the first colonial Veterinary Medical Association to become affiliated to the parent body, the "National," and they are again first in the field with their paper and report of the meeting. The Society is modern and progressive and has early discovered the advantages, social as well as professional, of collaborating with our medical colleagues, and it is interesting to note that the opener of the discussion was Dr. W. H. Kauntze, who is First Bacteriologist in the Colony. The paper itself does not need any review, and to read it is to appreciate the amount of labour and the extensive technical knowledge which the writer has put into his essay.

This response to the parent body's advances cannot but have a salutary effect on the whole profession and we can visualise in the future the formation of Divisions of the N.V.M.A. by Societies from neighbouring colonies; the N.V.M.A. becoming the Empire or Imperial N.V.M.A. Societies, whether colonial or at home, have everything to gain by collaborating both together and with the N.V.M.A.

In unity lies our strength. The more we unite for the common good, the stronger becomes our parent body and in its strength lies our future.

A parent body which is powerful can further its children's interests professionally, socially and politically.

Study of Udder Capacity.

"The udders of two cows killed at the Federal dairy experiment farm, Beltsville, Md., were removed immediately after slaughter and mounted in a position for *post-mortem* milking in a recent test to determine whether milk is manufactured during the few minutes required for the milking process, as is generally taught, or whether it is secreted continuously and collected in the udder previous to milking.

"It is quite generally held that the capacity of a cow's udder is not more than a half pint to each quarter and, therefore, that the milk must necessarily be manufactured during the milking operation. In these tests it was found, however, that a cow's udder is capable of holding from 11 to 20 quarts of milk. One of the cows had normally been giving about 12 pounds at a milking. When her udder was milked after being completely severed from all body connections, a total of 10·27 pounds of milk was obtained, or more than 85 per cent. of her normal production, indicating that this amount had been collected and stored as milk previous to her slaughter. The *post-mortem* milking of the second cow yielded practically 50 per cent. of her normal production. A considerable quantity of milk still remained, due to the difficulty with which it was released.

"In the opinion of W. W. Swett, Bureau of Dairy Industry, United States Department of Agriculture, these tests indicate that milk secretion is to a considerable extent a continuous process, and that a large proportion of the milk secured at any milking is collected and stored within the mammary gland before milking is commenced; also that the liberation of the milk from the gland is not dependent either upon a nervous or mechanical stimulation or upon internal muscular contraction.

"Extensive studies of the mammary gland are now being made by the bureau in connection with the relation of a dairy cow's conformation and anatomy to her milk and butterfat-producing capacity. This newest phase in the study of the mechanism of the dairy cow promises to be most interesting and highly productive of valuable information."—*Veterinary Medicine*, Chicago.

Errata.—In Dr. Tom Hare's article "Folliculitis and Impetigo of the Cow's Udder," published in last week's issue of the *Record*, on page 1083, second paragraph, "March, 1925" should read "March, 1926." In Tables D, page 1087, the complete lesion of Folliculitis should read "discrete superficial pustules," not "papules."

CLINICAL AND CASE REPORTS.

"Intermittent Hoven" in Cattle.

By J. C. Coleman, M.R.C.V.S., Swindon.

Common, or ordinary, "hoven" in cattle is so well known to the general practitioner in a cattle practice, that it is not my intention to go into details of its pathology, attributable causes, or the many methods of treatment which are adopted to bring about a recovery.

Many practitioners, I believe, invariably resort to the puncturing of the rumen to relieve the tympany of that organ, but I have always adopted the method of passing the probang, and allowing the gases to escape by that means, and it was my inability to do so upon one occasion in August, 1925, which led me to investigate the condition more carefully, and in the following four cases which have occurred, I was able to make *post-mortem* examinations.

Case No. 1.—I was called to a shorthorn cow, second calf, in August, 1925, which I found, upon arrival, down and almost *in extremis*, and the rumen enormously distended. I proceeded to pass the probang, but found it impossible to do so. I therefore punctured the rumen to relieve the tympany, and administered the usual remedies to prevent recurrence. Four days afterwards, I received an urgent message that "the cow was blown, even worse than on the first occasion," I therefore again punctured the rumen, etc., etc. This condition continued to recur every four to seven days for a period of nearly a month, when I again received an urgent message to come at once, and I arrived, twenty minutes after receiving the call, to find the cow dead.

I made a *post-mortem* examination and found an enormous caseated tuberculous mediastinal gland, measuring 15in. by 6in. in diameter, the shape of a vegetable marrow, laying on the œsophagus, between the lungs.

Case No. 2.—In November, 1925, I had a case of a cow reported under the Tuberculosis Order, 1925, as suspected tuberculosis, with rapid wasting. The owner informed me that the animal had been under treatment by a local practitioner for the past three weeks for "hoven."

The previous case aroused my suspicions as to the cause, I therefore submitted the cow to the intradermal and ophthalmic tests and, obtaining a very definite reaction, had her slaughtered.

Post-mortem examination revealed an exactly similar condition of, in this case two, mediastinal glands, the measurements of one being 11in. by 7in., and of the other 6in. by 3in.

Case No. 3.—In February, 1926, I was called very urgently to a Friesian bull, valued at £1,000. Upon arrival I found the rumen so distended that the swelling extended on either side to 4in. or 5in. above the vertebral column. I passed the probang with great difficulty and relieved the animal's distress, and in the following ten days I was called to repeat the operation three times. I then advised my client as to the condition I suspected and advised slaughter. The animal being of such value, the owner preferred that treatment be continued. This was done for six weeks, during which time I was called upon to relieve the tympany thirteen times. Upon the last occasion, however, I was too late, as the animal had died.

Post-mortem examination revealed three caseous mediastinal glands, No. 1 measuring 18in. by 4in., No. 2, 4in. by 2in., and No. 3, 7in. by 6in.

Case No. 4.—November, 1926. I was called in consultation by a local practitioner, to a heifer, first calf, in splendid condition, which had been under treatment for twenty-six days for "hoven," and during this period the rumen had been punctured five times to relieve the tympany.

Upon my arrival, I passed the probang with some difficulty, whereupon I gave it as my opinion that the repeated tympany was due to tuberculous mediastinal glands and advised immediate slaughter, to which the owner would not agree. The following morning, however, the beast had become so much worse, that my advice was acted upon.

Post-mortem examination revealed one tuberculous mediastinal gland measuring 18½in. by 4½in.

In all the above cases, with one exception, and that upon one day only, the temperatures were normal, and as soon as the distress caused by the tympany was relieved, the animals fed and drank normally and chewed their cud, until tympany recurred again.

As most practitioners are aware, bovines in health are frequently eructating gases from the rumen, but in the above cases the pressure caused upon the œsophagus by these enormous glands caused a choking sensation, which would tend to cause contraction of the muscle fibres above and below the obstruction, and no doubt extending to the constrictor muscles of the cardiac opening to the rumen. Under these conditions, gases in the rumen would have to reach a very high pressure before forcing open the passage to allow of eructation. This would not apply, however, where solid food, or a volume of water was being swallowed, or, after the tympany had been relieved, to the throwing back of the solid cud for re-chewing.

Perhaps it is necessary that I should report a case which I experienced twenty-three years' ago, which explains my reason for the above deductions.

I was called to a polo pony, apparently in perfect health, but each time that it drank water a swelling appeared at the side of the neck, varying in size according to the quantity taken. At my visit about two gallons of water were offered the pony, which it drank with avidity. A swelling, corresponding to the volume of water taken, immediately appeared on the side of the neck, subsiding in about two hours. Suspecting an œsophageal obstruction, I passed a small horse probang, but upon reaching that part of the œsophagus where it enters the chest, I felt an obstruction, which, however yielded to moderate

pressure. I patted myself upon the back, thinking I had removed some obstruction, which, by its history, must have been *in situ* for ten months. My elation was, however, of short duration, as the following morning I was requested to make a *post-mortem* examination upon the pony, which had died during the night.

Upon opening up the œsophagus, I observed, at the superior part of the inferior third, what appeared to be a fibrous tumour, the size of a goose egg, but upon carefully making a section of the growth, I was astonished to find that it was inflammatory tissue surrounding an unbroken hen's egg.

Palestinian Notes.

By H. A. IDENDEN, M.R.C.V.S. (Capt., late R.A.V.C.), Transjordan Frontier Force.

Here, in Palestine, it is a common belief that almost every ailment of the horse arises from the presence in the ala of the nostril of the comma-like cartilage, and this cartilage is therefore removed by means of a sharp razor. The operation appears to be regarded as a sovereign remedy and unfailing panacea for all ills. I have heard of its performance in cases of laminitis, with the truly surprising result of recovery—due probably to resultant hæmorrhage.

The Bedouin habit of searing with a hot iron for everything is probably well known—scoring the belly in colic; firing the limbs for lameness from shoulder or hip downwards, according to fancy; and, in camels, scoring the poll for brain symptoms, or fixing a ring round the wound of a sore back.

Catarrh and strangles with formation of submaxillary abscess are very prevalent on this side of the Jordan, I have had as many as over 80 down at once in this Force, infection being brought into these lines by the remounts, which I am purchasing in considerable numbers. I found the only method of stopping rapid infection from horse to horse to be the evacuation of stables by all horses, and picketing out in open lines. The spread of disease then ceased almost immediately, and the sick recovered with little or no treatment beyond the opening of the abscesses, which healed rapidly. But one cannot kill the Arab horse; he never becomes a roarer; he rarely suffers from colic; his lamenesses are few, and he is always "full of himself." His principal malady seems to be the sustaining of wounds from savagery, and from these he quickly recovers.

Congratulations to Mr. W. G. Byerley, F.R.C.V.S., upon his election, for the second time, as Chairman of the Public Health Committee of the Greenwich Borough Council, an honour which affords evidence of the increasing public recognition given to the value of the veterinarian in the consideration of matters pertaining to the health of the community.

Sewage Poisoning of Cattle.

INJUNCTION GRANTED.

The *Staffordshire Advertiser* (November 13th and 20th, 1926) reported the hearing in the Chancery Division, by Mr. Justice Romer, on November 9th, of an action which was brought by Wm. Sampson, farmer, Woodcroft, Stowe-by-Chartley, against A. T. Radcliffe, Broadmore House, Stowe-by-Chartley, and G. Sykes, Broadmore Farm.

Mr. Manning, K.C. (for plaintiff) said that the plaintiff asked for an injunction to restrain the defendants from discharging from their respective farms any sewage, oil, petrol, acid or other noxious or deleterious matter or liquid into the brook or watercourse flowing through the plaintiff's fields so as to cause a nuisance to him. He also claimed damages. Mr. Radcliffe was the owner and occupier of Broadmore House; he also became the owner of Broadmore Farm and occupied it from 1906 until 1923, when Mr. Sykes became the tenant. The main water supply of plaintiff's farm was derived from a stream, which was fed by spring water brought to it by land drains and by percolation through a field which sloped towards plaintiff's fields. Until Mr. Radcliffe extended his drainage system, the stream furnished a constant supply of pure drinking water for the use of plaintiff's cattle. For a number of years plaintiff carried on his farm comfortably, satisfactorily and profitably, but about six years ago his cattle began to suffer from some sort of complaint. Instead of his calves thriving they would waste away and die, and there was difficulty in getting the cows to calve; they kept casting their calves.

Plaintiff (in evidence) said that he usually kept three heifers and five dairy cows. From 1902 to 1912 he only lost one cow and that died over calving. Subsequently, his cattle did badly and, as time went on, more badly. In 1921 he called in a veterinary surgeon who said that the water was the cause of all the trouble. When the cattle were taken away from it, they improved. Before he had the trouble the milk output was 800 gallons per cow per annum, but he had been getting nothing like that quantity since.

Alfred Johnson, analytical chemist, of Jones and Son, Wolverhampton, gave evidence as to samples of water taken from the stream.

Alex. Levie, F.R.C.V.S., D.V.S.M., F.R.S.E., county veterinary officer for Derbyshire, said that in July, 1925, he was called in to examine a heifer. He found it suffering from emaciation due to chronic intestinal inflammation of the bowels. He valued it at £2; if it had been healthy it would have been worth £25. The heifer was killed and he formed the opinion that its condition arose from the action of bacilli from fœtal matter. He examined the drinking water and found it polluted. Polluted water might cause abortion in cattle if there was sewage in it. He considered that the plaintiff's heifer had suffered from sewage poisoning. In cross-examination, witness said he was asked to go and see if the heifer was suffering from sewage poisoning. He made full

enquiries and plaintiff told him that all his cattle had been removed from this drinking water in April, 1925, —twelve weeks before he saw the heifer. He agreed that Johnë's disease was rather prevalent, but its symptoms were not the same as those he observed in the heifer. It was true that there was a difference of opinion in his profession whether sewage poisoning produced these results.

J. C. Deville, M.R.C.V.S., Uttoxeter, local inspector for the Ministry of Agriculture, and for the Staffordshire and Derbyshire County Councils, said that in October, 1924, and in April, 1925, he attended some of plaintiff's cattle ; he formed the opinion that they were suffering from sewage poisoning. He examined the water and came to the conclusion that it was the source of the trouble. He was certain that the heifer was not suffering from Johnë's disease. In cross-examination, witness said that he knew Mr. Radcliffe's cattle had access to the same water and he knew of no instance in which they suffered from it.

The Defence.

For the defence, E. Forshaw, of E. Forshaw and Sons, architects, of Hanley and Stoke, said that he acted as architect and surveyor for Mr. Radcliffe's establishment. The sewage arrangements were of the usual kind for establishments in that part of the country and were quite adequate.

W. H. Makepeace, chief sewage engineer for Stoke-on-Trent, said that he had inspected Broadmore Farm and considered that the arrangements for sewage disposal were ideal and very efficient for a house of that description. Samples of drinking water which he took showed good drinking water for cattle. There were cattle on sewage farms under his control and they did not suffer, although they drank water containing sewage effluent from land on which sewage was being irrigated. Cross-examined, witness agreed that he took the samples a year after the action had been commenced, and after certain steps had been taken to prevent sewage going on to some of the fields of the farm.

G. Sykes, one of the defendants, said that none of his cattle had suffered from drinking water from this stream.

R. Murray, M.R.C.V.S., veterinary surgeon to, Mr. Sykes, said that he had never seen anything on the premises to suggest sewage pollution.

E. J. Salmon, farmer, said that he formerly occupied the farm adjoining plaintiff's. The stream ran through his farm, but he never had anything to complain of in regard to sewage. He admitted that he had had disease with his cattle. He called it Johnë's disease. He lost several cattle each year, but the damage was not due to drinking polluted water. The disease was prevalent in the district.

A. T. Radcliffe said that he had never had any unusual disease in his cattle and it had nothing to do with the septic tank.

Sir Thomas Hughes, K.C., for the defendants, said that the sewage system on defendants' land was the only kind possible in agricultural districts. Mr. Sykes' cattle, which were much nearer to the alleged pollution, were exceptionally healthy. The same condition of things had been going on for 20 years and matters were probably better now than formerly.

Injunction Granted.

Mr. Justice Romer, in giving judgment, said that plaintiff had occupied his farm from 1902 down to the present. Close to his farmhouse was an open ditch through which there ran at all seasons of the year a stream of water, and that water was, up to April, 1925, used by plaintiff for the purpose of watering his cattle. For that purpose in 1903 plaintiff constructed an approach and caused the water to be dammed up by an open sill. This ditch was supplied with water by means of land drains coming from Broadmore House and from Broadmore Farm. Plaintiff charged both defendants with sending down sewage and also charged Mr. Radcliffe with sending down oily matter into plaintiff's open ditch, so as to cause injury to plaintiff's cattle. These land drains had been inexistence before 1902. When plaintiff went to the farm and for some years afterwards the water in the ditch and in the trough was clear. Watercress grew in it, and men used to drink the water without ill results. For ten or twelve years after plaintiff went to the farm he had no trouble of any sort beyond the trouble that usually attended farmers. But from then up to April, 1925, he had considerable trouble with his cattle, which increased in intensity. His cows aborted, they were sterile and in poor condition. He had no doubt that in olden days some wretched old woman in the neighbourhood would have been burned at the stake in consequence of that state of affairs. But plaintiff took the more modern view that it was due to his ill-luck and he did not in any way attribute it to the water supply. But in 1921 he came to the conclusion the water might have something to do with it, because he thought that sewage from Broadmore House, instead of being turned into the fields, was being turned directly down a ditch and so into plaintiff's own ditch. As it turned out, he was right. In 1923 he thought the sewage must be getting into his water from Broadmore Farm. Plaintiff continued to have great trouble with his cattle and in April, 1925, he consulted Mr. Deville, who advised him that the whole cause of the trouble was that this water was being polluted with sewage matter. Plaintiff removed his cattle to another part of the farm, and two heifers that were ill recovered. One other was in a hopeless condition, and was slaughtered. Mr. Levie, an expert, diagnosed its illness as sewage poisoning. He (the judge) was satisfied that the heifer died from drinking sewage-polluted water and that the water, when Mr. Levie examined it, was polluted with sewage. Defendant called a Mr. Salmon, who from 1920 to 1926 occupied a farm adjoining plaintiff's, and whose cattle took the same water after it had passed through plaintiff's farm. Mr. Salmon said he had no complaint to make of the water, but on cross-examination, he said he had experienced the same trouble with his cattle as plain-

tiff had experienced, but he thought they were suffering from Johnë's disease. He had no veterinary surgeon to advise him. He only shrugged his shoulders and tried to make the best of it. The symptoms of the two diseases were very similar. He (the judge) could not regard Salmon's evidence as showing that the water was uncontaminated. The conclusion he had come to, so far as Broadmore House was concerned, was that it had been the practice, increasing much more since 1919, for Mr. Radcliffe to contaminate plaintiff's water with sewage, and also with oil refuse from the exhaust pipe of his plant and machinery. In regard to what happened at Broadmore Farm, he held that as regards Mr. Sykes, the action failed, and must be dismissed with costs. He granted plaintiff an injunction and an inquiry into damages as against Mr. Radcliffe.

Successful R.C.V.S. Prosecution.

At the Wealdstone Police Court, on the 16th November, 1926, James Woodward was prosecuted at the instance of the Royal College of Veterinary Surgeons for placing the letters "M.R.C.V.S." after his name and also for describing himself as a veterinary surgeon, he not being a member of the Royal College of Veterinary Surgeons, contrary to Sections 16 and 17 of the Veterinary Surgeons Act, 1881.

Mr. R. Fortune (instructed by Messrs. Geo. Thatcher and Son) appeared for the Royal College of Veterinary Surgeons, the defendant being represented by Mr. J. A. Morley.

The first complaint was founded on a card bearing the description "The Crichton Kennels (James H. Woodward, M.R.C.V.S.)," which was sent by the defendant in response to an enquiry for treatment of a cat with particulars of his charges written on the back of the card. The second complaint was founded on a letter written by the defendant to a Mr. Clark in which he used the following words, "in my capacity as a veterinary surgeon."

The Defendant pleaded guilty to both summonses through his advocate, who stated that the defendant had acted in ignorance of the law and that he had served in the Royal Army Veterinary Corps during the war.

The Bench convicted the defendant on both summonses and ordered him to pay a fine of £5 and £2 2s. 0d. costs.

R.C.V.S. Library.

The following books were added to the Library of the R.C.V.S. during the past week :—

MERILLAT. "Poll Evil."
NUTTALL. "Ticks." A Monograph of Ixodoidea (4 parts and Bibliography).
EAKINS. "Military Meat and Dairy Hygiene."
KLEIN. "Principles and Practice of Milk Hygiene."
YORKE AND MAPLESTONE. "The Nematode Parasites of Vertebrates."
BAYLIS AND DAUBNEY. "A Synopsis of the Families and Genera Nematode."
MERILLAT. "The Principles of Veterinary Surgery."
ALBRECHTSEN. "The Sterility of Cows."

Books may be borrowed from the Library by Members of the College on payment of postage both ways. Apply to the Librarian.

Milk and Dairies (Consolidation) Act, 1915; Tuberculosis Orders, 1925.

Conference at Lewes.

A conference on the working of the Milk and Dairies (Consolidation) Act, 1915, and the Tuberculosis Orders, 1925, was held at the East Sussex County Hall, Lewes, on Thursday, November 4th, 1926, at 4 p.m.

There were present Mr. J. Gibb (Chairman of the Public Health and Housing Committee of the East Sussex County Council) in the Chair; Mr. A. G. R. Foulerton, F.R.C.S. (County Medical Officer of Health); Mr. R. H. B. Jesse, B.Sc., N.D.A. (Director of Agriculture); Mr. L. R. Edwards (Secretary to the Agricultural Committee); and the following County Veterinary Inspectors:—Messrs. W. Andrews, M.R.C.V.S., of Hurst Green; H. V. Dier, M.R.C.V.S., of Mayfield; J. B. Dier, M.R.C.V.S., of East Grinstead; W. D. Halfhead, M.R.C.V.S., of Hailsham; J. W. M. Hinton, M.R.C.V.S., of St. Leonards-on-Sea; E. W. Morris, M.R.C.V.S., of Uckfield; J. P. Pritchard, M.R.C.V.S., of Brighton, and H. Taylor, F.R.C.V.S., of Haywards Heath. Mr. W. Brown, Chairman of the Diseases of Animals Acts Sub-Committee of the County Agricultural Committee, was unavoidably absent from the conference.

The Chairman stated that the Public Health and Housing Committee of the County Council had had under their consideration how they could best carry out their duties under the *Milk and Dairies (Consolidation) Act*, 1915. More particularly had the question been considered as to whether, in view of considerations of efficiency and economy, the work would be done better by utilising the services of the County District Veterinary Inspectors for the purposes of the Act, or by the appointment of whole-time veterinary inspecting officers. One of the reasons for the present conference was that they might hear the views of the County District Veterinary Inspectors in the matter.

Mr. A. G. R. Foulerton then referred to the various points in the administration of the Act and Orders. He said: The Act of 1915 made it an offence (*Section* 5) for any person to sell, or offer or expose for sale, or to suffer to be sold for human consumption, or for use in the manufacture of products for human consumption, or to use or suffer to be used in the manufacture of products for human consumption the milk of any cow which (*i*) has given tuberculous milk, or (ii) is suffering from emaciation due to tuberculosis, or (iii) is suffering from tuberculosis of the udder, *or from any of the diseases specified in the Second Schedule to the Act.* The diseases specified in the Second Schedule were (iv) acute mastitis; (v) actinomycosis of the udder; (vi) anthrax; (vii) foot-and-mouth disease; (viii) suppuration of the udder. It is provided in the schedule also that Section 5 of the Act shall apply to any other diseases affecting cows which by a Milk and Dairies Order is declared to be a disease for the purposes of that Section. *The Milk and Dairies Order*, 1926, declared the following to be diseases for the purposes of *Section* 5 of the Act:—(ix) any comatose condition, or (x) any septic condition of the uterus, and (xi) any infection of the udder or teats which is likely to convey disease to man. If a cow is suffering from tuberculous infection, not only must the

milk not be used for human consumption, but the farmer must forthwith notify the case to the police under the *Tuberculosis Orders*. If, on the other hand, the cow is suffering from any of the diseases specified under (ii) to (xi), the farmer must not allow the milk to be used, but is not under any obligation to notify anyone. If, however, the farmer does, voluntarily, notify the local authority, or if the local authority ascertain the disease in the course of a routine inspection of the herd, they may prohibit the sale of milk either from the dairy as a whole, or from any particular cow or cows. There is a curious difference as to the limitation of a "prohibition order," according as to whether the disease is one of those (ii) to (viii) specified in the Act and its Second Schedule, or whether it is one of the last three (ix), (x) and (xi) specified in the *Order* of 1926. The first Schedule to the Act provides that a prohibition order shall be withdrawn as soon as a responsible authority or their medical officer of health are satisfied that the milk as to which action has been taken, is no longer likely to cause human disease. In the cases of the other three diseases, a prohibition notice may be issued by an officer of the responsible authority, but the notice of prohibition is only effective for a period of five days, and has to be renewed every fifth day, as many times as may be necessary. Therefore, when a prohibition "order" or "notice" has been issued, a second visit, and in many instances other repeated visits, by the veterinary inspector will be necessary in order to give effect to the provisions of the *Order* of 1926. In connection with this also, there is the very considerable expense which would be incurred if the present scale of fees payable to part-time veterinary inspectors is not modified. Under the Act the principal offence is to allow the milk of a cow which is suffering from tuberculous disease to be used for human consumption. Under the *Tuberculosis Orders*, 1925, the principal offence is failure to notify the police of any cow which is, or appears to be, suffering from tuberculosis of the udder, indurated udder, or any other chronic disease of the udder, or any bovine animal which is, or appears to be, suffering from tuberculous emaciation, or any bovine animal which is suffering from a chronic cough and showing definite clinical signs of tuberculosis. It will be noticed that there is a certain amount of duplication in the nomenclature of the diseases which come within the purview of the Act and the *Order of* 1926 respectively. A cow suffering from tuberculosis with emaciation or from tuberculosis of the udder can be dealt with, in the first place, under either the Act or the Order. Similarly, a cow which is suffering from (viii), as above, might be dealt with in many cases either under the Act as a case of suppuration of the udder, or under the Order as being a cow suffering from induration of, or chronic disease of, the udder. It would be interesting to hear from the veterinary officers present exactly how they would differentiate, from the clinical point of view (ii) "acute inflammation of the udder"; (iv) "acute mastitis"; (viii) "suppuration of the udder," and (xii) "indurated udder," or "other chronic diseases of the udder." So far as he himself was concerned, he would advise the responsible authority under the Act to prohibit the use of the milk in any case in which, apart from the question of tuberculous infection, the veterinary inspector certified that there was a definite swelling or induration of the udder, and in which pus was found in the centrifugalised sediment from a sample of the milk. It would be interesting also if the veterinary surgeons present would discuss the exact limitation of the term "any septic condition of the uterus." Was every case in which the placenta was retained for any undue length of time to be regarded as one of "septic condition"?

It might be added, as a matter of interest, that during the first twelve months of the working of the Act in East Sussex, 540 cows have been slaughtered under the Tuberculosis Orders, 1925, and that, of these, 533 showed after death manifest lesions of a tuberculous infection.

The various points raised were discussed by the veterinary surgeons in turn, and it was agreed that there might be considerable difficulty from their point of view, in deciding when a cow had sufficiently recovered from a chronic mastitis, with suppuration, for her milk to be put into use again. Again, there was some little difference of opinion as to cases of unduly prolonged retention of the placenta which should be regarded as cases with "septic condition of the uterus," but the Medical Officer of Health remarked that he ought to be notified if a farmer used the milk from a cow with retained placental membranes, if there was sepsis and the case was only met with in the private practice of a veterinary inspector. With respect to cow pox, the M.O.H. remarked that he had experienced eight epidemics from that condition.

The question of fees in cases in which repeated visits at five-day intervals by the veterinary inspector to the same cow were required, was considered, and the general feeling of those present was that a reasonable arrangement would be for the usual fee to be paid for each visit, but for the mileage allowance to be charged in the cases of the first and last visits only. Reasonable farmers would probably notify the inspector when the udder became normal and so save the expense of visiting every five days.

The conference terminated with a vote of thanks to the Chairman, and to the M.O.H. for his able and instructive address.

The Working of the Tuberculosis Order in Lanark

The following figures contained in the recently-published statements of the County Council of the County of Lanark relative to the working of the Tuberculosis Order of 1925 in the area, will be of interest to our readers.

The total number of animals dealt with under the Order during the year was 621, of which 323 gave negative, and 287 positive results on examination, 11 having died or having been killed by the owner during the investigation.

In a statement dealing with the cost of compensation, administrative expenses and net cost to the local authority, it is shown that the amount of actual gain to the local authority in positive cases amounted to £13 4s. 0d., while the sum of £166 odd, was expended in dealing with negative cases. The figure of £812 odd, is given as the estimated expenditure for the year (this sum including the cost of proportionate salaries, clerical assistance, etc.), which makes the average cost per cow dealt with under the Order to be approximately 26s.

Concerning the form of tuberculosis present, 66 animals were affected with tuberculosis of the udder, one was giving tuberculous milk, 79 showed tuberculous emaciation, and 135 tuberculosis with chronic cough. The total sum disbursed as compensation was £1,508 odd, making an average of £5 5s. 0d. per slaughtered animal.

DIVISIONAL REPORT.

The Veterinary Medical Association of Kenya Colony and Protectorate.

Tue second ordinary General Meeting of the Veterinary Medical Association of Kenya Colony and Protectorate was held at the Veterinary Laboratory, Kabete, near Nairobi, on Friday and Saturday, July 30th and 31st.

The President (Lieut.-Colonel Doherty) occupied the Chair, and the following Fellows were present: Messrs. Creery, Whitworth, Mulligan, Daubney, Scott Little, Emerson, Brassey Edwards, and the newly-nominated member, Mr. G. Scade.

The following Members of the local British Medical Association were present by invitation: Dr. C. J. Wilson, Acting Principal Medical Officer; Dr. E. Guinness, Dr. E. C. Johnstone, Dr. Kauntze, and Mr. Kelly, Bio-Chemist, Medical Department.

The PRESIDENT, in opening the meeting, commented on the fact that the second meeting of the Association should be a joint one with their medical brethren, in as much as the paper to be read by one of the members would have the discussion on it opened by the Director of Medical Laboratories. He welcomed the visitors, and referred to the similarity of the work of the two professions, a fact which he felt sure would have been noted by their medical visitors on their tour of inspection of the laboratory buildings. He trusted the meeting would be a forerunner of many similar meetings to discuss matters of joint interest.

Dr. S. H. Whitworth, Veterinary Research Officer, Kabete, Kenya, then presented his paper on "Anthrax."

(Dr. Whitworth's paper appears elsewhere in this issue. A supplementary paper by him on the subject, and the discussion which followed, will be published in successive issues.—Ed.).

On the following day, when the meeting was continued, the PRESIDENT expressed the deep sympathy of the meeting at the loss of the late Sir Stewart Stockman and Mr. M. H. Reid, all members upstanding.

It was noted with pleasure that the affiliation of the local Association to the National Veterinary Medical Association of Great Britain and Ireland had been accepted, and it was resolved that all Fellows present would become members of the parent body as soon as the official application forms for admission were available for signatures.

The Hon. Secretary informed the meeting that he had written to the General Secretary of the National Veterinary Medical Association of Great Britain and Ireland, asking that a number of application forms be forwarded.

A recommendation from the Council to publish a veterinary journal under the *aegis* of the Veterinary Medical Association of Kenya Colony and Protectorate was discussed at some length, and finally the following resolution was proposed, seconded and carried with

(Continued at foot of next column.)

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest inclusion in these columns.

AN IMPORTANT APPOINTMENT IN EGYPT.

We desire particularly to direct the attention of those of our readers who are in a position to offer themselves as candidates, to the announcement made in our advertisement columns this week, inviting applications for a post in the Veterinary Service of the Ministry of Agriculture, Egypt, in the capacity of a pathologist and bacteriologist. We learn that in connection with this appointment the High Commissioner for Egypt has communicated with the Foreign Office stating that the Egyptian Government have asked for his assistance with a view to securing the best British candidates available. It is a matter of great political importance that highly-qualified and suitable British graduates for these posts should be found, and the Secretary of State for Foreign Affairs has requested the Royal College to suggest any means whereby suitable candidates can be obtained for the post. The salary offered is £900 but a considerably higher salary would, it is understood, be paid to a first-class man.

MILK AND DAIRIES ORDER.

At a recent meeting of the Unionist Parliamentary Agricultural Committee, the Minister of Agriculture referred to the willing co-operation which had taken place between his Department and that of the Ministry of Health in connection with the above Order; and it was announced that local sanitary officials throughout the country were to be given the opportunity of courses of instruction at agricultural centres, with the view of letting such officials be made acquainted with the difficulties of milk production, and consequently the desirability of mitigating unnecessary restrictions on the farming community.

The Minister of Health stated that he was prepared to issue a circular to local authorities, emphasising the need for the reasonable administration of the Order, having regard to the difficulties attaching to milk production. Stress was laid on the importance of cleanliness in cow-keeping methods rather than the need for a large expenditure in connection with structural alterations.

(Continued from previous column).

only one dissentient: "That this Meeting is in favour of a publication of a Kenya Veterinary Journal under the *ægis* of the Veterinary Medical Association of Kenya Colony and Protectorate," and further: "That the editorial committee shall be composed of the following members: Messrs. Doherty, Walker, Daubney and Brassey Edwards, with Mr. Daubney as the Editor."

The following resolution was proposed and carried *nem. con*: "In view of the general interest taken in the Pan-African Veterinary Conference, it is the desire of this Association that conferences should be held every three years, and a copy of this Resolution be sent to the Executive Committee of the Fifth Pan-African Conference."

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

A Proposed Alteration in the Students' Curriculum.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Mr. Macfarlane's letter in your issue of November 27th, deals with several points in connection with the regrouping of subjects in the prescribed course of study for the diploma of the Royal College of Veterinary Surgeons. I am particularly interested in his suggestion that elementary chemistry and botany should be regarded as compulsory subjects for the entrance examination and thereby eliminated from the professional curriculum. So long ago as 1912, in a paper read before the National Veterinary Association at Manchester, Major General Smith pointed out that elementary science took up too much time in the curriculum.

As years go on, professional subjects demand more time for study and it certainly seems that a five years' course is the only alternative to dropping school subjects. Instruction in elementary science should not be required in a vocational College. It is now provided in secondary schools with the necessary accommodation and equipment. A vocational College should deal with the specialised branches of the sciences which relate to its curriculum and be equipped accordingly. Among other advantages, there is economy in staff and equipment.

In dealing with the course of study prescribed in the Punjab Veterinary College, this question has been seriously considered, and, in spite of the fact that the present curriculum has been modelled to a considerable degree on that of the Royal College of Veterinary Surgeons, the question of eliminating elementary science has already been discussed. The result may be that these subjects are included in the entrance examination or, alternatively, taught extramurally. It is surely a matter for the serious consideration of the Council of the Royal College of Veterinary Surgeons that, instead of making minor alterations in the present course of study, a complete revision should be discussed with a view to bringing it into line with modern requirements. To meet these, it appears that the only alternative to the adoption of a five years' course of study is to demand a sufficient knowledge of elementary science for the entrance examination. Chemistry (inorganic and organic), with physics and botany are the subjects involved. Zoology presents some difficulties. The special zoology required in a veterinary curriculum might, however, be suitably included in the vocational course.

For a University degree, the matriculation standard would be a necessity, but for the diploma of the College the school leaving certificate might suffice.

The question of standard would necessarily be subjected to close examination and discussion before any decision was made. This is not the occasion or place to discuss this big question in its entirety, but to invite attention, and possibly, some constructive discussion. I venture to append a copy of the preliminary draft of a course of study which I have had under consideration for some time. If the occasion should arise, the advantages and disadvantages might be discussed at length with a view to making requisite alterations and amendments. I might state incidentally, however, that Animal Management is now included in the first year's course of study at the Punjab Veterinary College and the arrangement has been found to possess many advantages. Not the least is that, should a student discover that he is not so partial to animals as he thought he was before entering the College, he can close his career as a veterinary student with less expense than if he delayed his decision for another year.—Yours faithfully, G. K. WALKER (Colonel), Principal, Punjab Veterinary College (on leave).

APPENDIX.

A proposed course of study for a Veterinary Diploma.

Entrance Examination.

English, Mathematics, one modern language (French, German, Spanish), Chemistry (organic and inorganic) and Physics, Botany and one of the following:—Latin, one modern language (French, German, Spanish), History, Philosophy.

N.B.—Standard to be decided after scrutinising test papers of various examining bodies.

First Year—Preliminary Examination.

I.—Zootechny and Animal Management, including:—
- (*a*) The principles of breeding and animal conformation—care of animals in health—methods of restraint.
- (*b*) Pharmacy, including the administration of medicines and nursing.
- (*c*) Minor Surgery, including the principles of shoeing and practical knowledge in removing shoes and paring feet.
- (*d*) Riding test.

II.—The Anatomy of the Horse (type animal) including Dentition, and

III.—Special Zoology* and Histology.

Second Year—Intermediate Examination.

I.—The Anatomy of the Domesticated Animals (horse, ox, sheep, pig and dog), including Dentition.

II.—Zoophysiology, including Physiological Chemistry, and

III.—General Hygiene and Dietetics, including the Chemistry of Foods and Agricultural Botany.

Third and Fourth Years—Final Examination.

Part I.

I.—Pathological Instruction, to include:—
- (*a*) Morbid Anatomy and Histology.
- (*b*) Bacteriology.
- (*c*) Parasitology.
- (*d*) Helminthology.
- (*e*) Entomology.

II.—Special Hygiene, including Meat and Milk Inspection, and

III.—Epizootiology, including Immunology, Sanitary Law and Administration.

Part II.

I.—Veterinary Surgery, including the examination of animals for soundness and pathological shoeing, Obstetrics and Ophthalmology.

II.—Semiology and Clinical Diagnostics, and

III.—Pharmacology, including Materia Medica, Toxicology and Therapeutics.

N.B.—After the above two years' study a student, who is otherwise eligible, may present himself for examination in both or one of the above parts and each part may be passed separately. Examinations half-yearly.

* To include particularly the dissection of the fowl.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Mr. Macfarlane's letter in the *Record* of November 27th, on a proposed alteration in the students' curriculum, deserves the most careful consideration. There seems to be in contemplation a move to deprive Stable Management of its status as a major subject, tuition in it to be given, as at present, during the second year, but the examination to be merged with the examination in Hygiene at the end of the third year. This undoubtedly means that, with those who have the arranging of our curriculum, Stable Management is falling into lower esteem than it previously enjoyed. I am sure that in the general body of the profession, few will be found to agree that this should be so.

Perhaps it is putting the argument in its lowest form to say that our clients judge us very largely by the way we go about our work, but, after all, there is something to be said for their attitude; a veterinary surgeon who is not able to handle his patients in skilful and workmanlike

fashion does justice neither to himself nor to his profession. The framers of our membership diploma I feel certain would choose their words carefully, and it would not be intended just as an idle phrase when they said "to *practice* the art and science of veterinary surgery." Surely, that includes the skilful manipulation of our patients. Any experienced practitioner could give countless instances where, through, lack of suitable help, he has had to buckle to himself and do things which in the ordinary course would be part of the attendant's duty. And he does not lose, but rather gains, in dignity and repute by doing them well. From the putting of a twitch on a horse's nose to the handling of a cow's foot, the securing of a biting dog or a scrambling, scratching cat, there are numberless occasions that call for that sureness and deftness of touch and manner, confident, and yet careful, which we call animal management.

It is not less of this that is needed in the curriculum, but more. I am glad to know that in one college, at any rate, instead of the twenty hours allotted to it in the bye-laws, from forty to fifty hours' instruction is given in this subject. By some, I am afraid, it is looked on as the poor relation of veterinary science, to be shepherded discreetly into the background, where it may remain unnoticed among the more high-sounding titles within our portal. Like Mr. Macfarlane, I am all for full recognition of its worth and long lineage.—I am, Yours faithfully, DONALD CAMPBELL, M.R.C.V.S.

35 Calderwood Road, Rutherglen.
1*st December*, 1926.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I was interested to read Mr. Macfarlane's comments on the above, and I agree with most of what he says.

I think that Stable Management should go with Hygiene, and that Shoeing should go with Surgery; but that the teaching of it should start early and be more thorough than was the case in my time.

The Royal College should revise the whole curriculum, which is out of date. Botany, with the exception of the study of poisonous plants (which is a part of Hygiene) is a superfluous subject, and the same remarks apply to Zoology and Physics. Very little attention and insufficient time are devoted to Parasitology, and the study of Sterility and other diseases. The gap which at present exists between Chemistry and Materia Medica should be lessened.

Unless these superfluous subjects are eliminated it is hardly possible or fair to expect the students to master the more important ones. There is no doubt that efficiency in horse-mastership (including, of course, being able to ride and drive a horse) should be part of the training, and students would be better employed in acquiring this, than in toiling over the classification of plants, or dissecting frogs and dogfish. What earthly use either of these subjects are to the student after graduation, I have yet to discover.—Yours faithfully, J. F. D. TUTT, M.R.C.V.S.

1 St. Cross Road, Winchester.
4*th December*, 1926.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—As one who has quite recently gone "through the mill" of the R.C.V.S. curriculum, may I be allowed briefly to state my opinion on the proposed alteration in connection with Stable Management.

The suggestion to incorporate the examination on this subject with the Class C, Hygiene and Dietetics examination, while continuing their teaching in Class B, would, I fear, merely aggravate the present unsatisfactory state of affairs. Students, as a rule, learn more during the few weeks prior to the examinations, than during all the previous weeks of the session; obviously under the spur of the impending 'inquisition.' Consequently, subjects on which the examinations are comparatively remote tend to be neglected. The teaching of Stable Management, which requires to be studied seriously—especially by town-bred students—will, under the proposed new conditions, suffer very much.

The proposal made, I think, by Dr. Whitehouse, to give students failing only in this subject the right to enter Class C, and to take their re-examination as a single subject, gives the proper lead on this question.

At the same time, is it not possible that a special, more or less voluntary, class for the 'awkward squad' during their first year would make a decided improvement and be much appreciated by the students concerned? Such a class could easily be tutored by a senior student, who would demonstrate the rudiments of the subject.—I am, Yours, etc., JOHN M. MITCHELL, M.R.C.V.S.

Lichfield.
December 1*st*, 1926.

"Veterinary Benevolence."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—May I, on behalf of the Council, thank you for publishing so opportunely an appeal for further subscriptions to the Victoria Veterinary Benevolent Fund? I have delayed this acknowledgement, in the hope that I might have been able to send you a long list of subscriptions sent in answer to your appeal. Strange to say, only three new subscriptions have come in, one of which is from an unregistered practitioner; he sends £5 5s. in memory of his mother, who, as the widow of a Member of the College, was left too poor to send her son to College. Needless to say, the Council of the Fund will accept the subscription in the spirit in which it is given.

Our Fund ought to be able in these days to guarantee that, in a similar case, the son of a Veterinary Surgeon should be helped to study for his Diploma.

May I express the hope that before the books are closed on the 31st instant, I may have the pleasure of acknowledging many further subscriptions.—Yours faithfully, FRED BULLOCK, Secretary, Victoria Veterinary Benevolent Fund.

10 Red Lion Square, London, W.C.1.
6*th December*, 1926.

"An Atypical Case of Anthrax."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In connection with Mr. W. A. Campbell's letter in your issue dated 16th October, 1926, it would be interesting to know whether smears (blood) were taken from any of the animals referred to whilst they were suffering from a high temperature.

If not, possibly Mr. Campbell might do so in future cases.

In your issue dated 26th May, 1923, I recorded a complete recovery in an ox, which showed a heavy blood infestation (blood being taken from the ear), and have since had a further case.—Yours faithfully, R. PAINE, F.R.C.V.S.

Grahamstown, South Africa.

A "Dangerous Drug"?

TO THE EDITOR OF THE VETERINARY RECORD.

Sir—In view of the importance of sodii bi-carbonate lately emphasised in your journal, I am sending you this epitaph, which occurs in a Burlington Churchyard:—

"Here lies the body of Mary Ann Lowder,
She burst while drinking a seidlitz powder.
Called from this world to her heavenly rest—
She should have waited till it effervesced."

Yours truly, H. S. PURCHASE. (A veterinary student).

The Editor acknowledges the receipt of the following:—

Report of a meeting of the Scottish Metropolitan Division from Mr. Wm. C. Miller, Hon. Secretary.

Communications from Messrs. Hugh Begg (Hamilton), J. J. Collins (Bowdon) and G. B. Purvis (Edinburgh).

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, "Veterinary Record," 10 Gray's Inn Square, W.C.1

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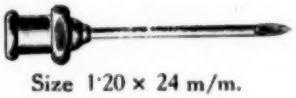

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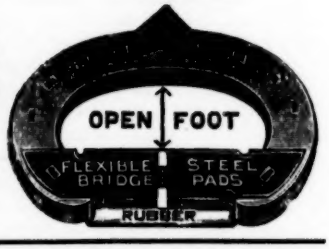

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